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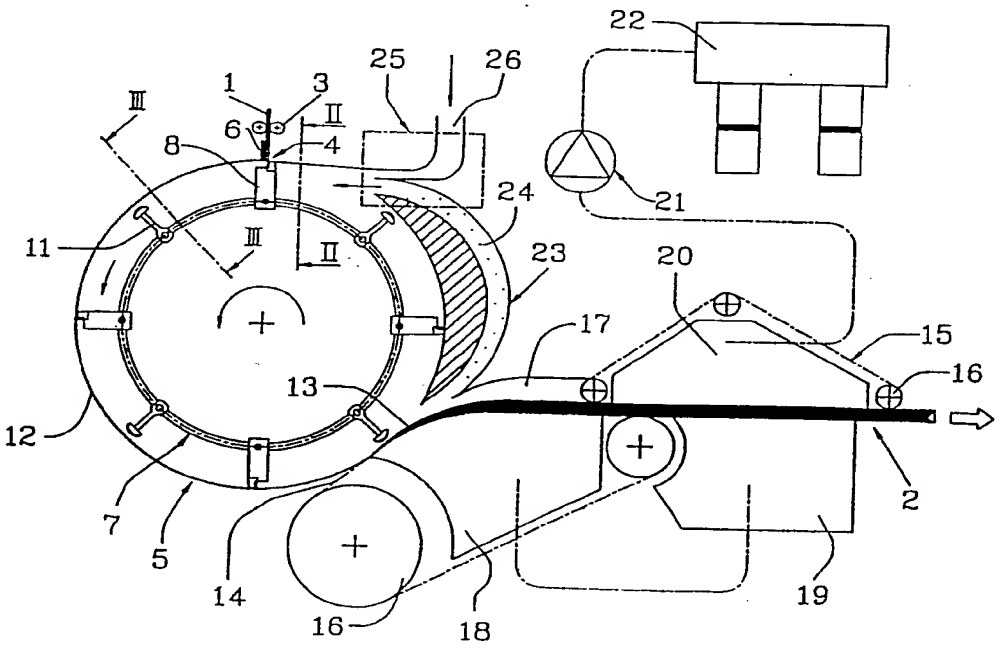
**(54) Title:** APPARATUS AND METHOD FOR PRODUCING A FIBER MATERIAL WEB

**(57) Abstract**

The present invention relates to an arrangement and a method for producing a fiber web (2) from pulp. The arrangement includes a clipping unit (3, 6, 8) for clipping the pulp (1), a defibering unit (5, 7, 11) for mutually separating fibres in the clipped pulp, and a forming unit (15-20) for forming the fibre web. The defibering unit includes a rotor (7) which is journalled in a casing (5) having a pulp inlet (4) and a fibre-outlet opening (13). The rotor (7) carries defibering hammers (11) for coaction with a shredding surface (12) located on the inner surface of the casing. The fibre-outlet opening (13) permits both mutually separated fibres and incompletely defibered pulp to be discharged from the casing (5). Connecting with the opening is an outlet channel which is substantially tangentially relative to the casing initially and thereafter curved outwardly. A bundle separator (23) has a bundle separator channel (24) which branches from the outlet channel at the point where the channel departs from its tangential course, and the bundle separator channel (24) has an inlet end having a continued, substantially tangential course.

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# Apparatus and method for producing a fiber material web.

## Technical field

The present invention relates to an apparatus and a method for producing a fibre web from a pulp,e.g. cellulose pulp, preferably a liquid absorbent web. More specificly, the invention relates to an arrangement in apparatus for producing a fibre web from pulp, comprising a clipping unit for dividing the pulp into pieces, a defibering unit for mutually separating fibres in the clipped pulp pieces and forming a stream of gas-suspended fibres, a forming unit including at least one endless, gas-permeable conveyor belt for forming a fibre web from the suspended fibres on one side of the conveyor belt while a subpressure is maintained on the opposite side of the conveyor belt, and a fibre-bundle separator for removing bundles of incompletely defibered pulp from the mutually separated fibres, wherein the defibering unit includes a rotor which is rotatably journalled in a stationary casing having a pulp inlet and an outlet for mutually separated fibres, and wherein the periphery of the rotor is spaced from the inner surface of the casing and carries thereon a plurality of defibering hammers which are intended to coact with a pulp shredding surface located on the inner surface of the casing within a region which extends from the pulp inlet to the fibre outlet.

## Background art

Various methods and apparatus are known for producing layers of fibrous, liquid-absorbent material for use in the manufacture of disposable diapers, incontinence guards and like articles.

A pre-shredded pulp in flake form is fed into a disc refiner, centrally between two circular refiner discs which can be rotated relative to one another. At least one of the

discs has formed therein radial grooves with which the pulp is worked, such as to mutually separate the pulp fibres. The mutually separated fibres are discharged through an outlet located at the periphery of the discs. Although a disc refiner will produce defibered pulp, fluff, of good quality, it has the drawback of being expensive. Another drawback with such refiners is that the pulp must be shredded into flakes before the pulp can be processed in the refiner, therewith eliminating the direct use of so-called roll pulp, i.e. pulp that has been wound in roll form.

When pulp is processed in a conventional hammer mill, the mutually separated fibres pass through a sieve, the mesh size of which is such as to only allow fibres of a predetermined desired size to pass through. Consequently, there is formed upstream of the sieve in said mill a carpet of material which has still not been worked sufficiently to be able to pass through the sieve. Thus, in addition to performing the actual work of defibering the pulp, the hammers must pull or like-wise entrain this fibre mass as they rotate, which results in high energy consumption. Furthermore, quality of the fibres is impaired by this treatment.

A fluff mat is produced conventionally in different part stages. Subsequent to clipping or shredding the ingoing pulp, the pulp pieces are fed into a refiner or a mill in which the pulp fibres are mutually separated into fibres of long, medium and short lengths. The flow of fibre material is passed through conduits to a portioning device, wherein in some cases part of the short fibres and non-defibered bundles are isolated from the flow of fibre material during its passage to the portioning device. The mutually separated short fibres are returned to the process at a later stage, whereas the fibre bundles are returned to the mill for further processing. The fibre material flowing from the

portioning device is passed to a forming device in which fibre layers or webs are formed on endless, air-permeable conveyor paths. A conventional system consumes a considerable amount of energy, due to long transportation paths in narrow conduits and ineffective degradation and defibering of the pulp. In turn, the high energy consumption generates heat, which affects the mutually separated fibres unfavourably, said fibres becoming brittle and resulting in a fluff mat of poorer quality. The design of conventional mills is such that there is generated within the mill a partial overpressure which results in the departure of particles through openings and gaps in the mill, and therewith in the creation of environmental problems. These problems are further amplified by the fact that only a part of the total amount of short fibres are recovered in the process, the remainder either fastening in and blocking the filters required by the apparatus or contaminating the ambient air.

The basic concept of the invention

An object of the present invention is to solve the aforesaid problems by providing apparatus of low power consumption which apparatus will enable production of a final product in the form of a fluff mat which has uniform quality and which therefore need not be further processed, and wherein the thickness or weight per surface are (grammage) of the fluff mat can be regulated with considerable flexibility. When practising the inventive method, the starting material may be recovered to an unusually great extent, resulting in improvements to the environment.

These objects are realized in accordance with the invention with an apparatus of the kind described in the introduction which is further characterized in that the fibre outlet is an opening through which both the mutually separated fibres and the incompletely defibered pulp can exit from the casing

and with which there is connected an outlet channel which initially has a substantially tangential extension relative to the casing and thereafter an outwardly curved extension, while the bundle separator includes a bundle-separator channel which branches from the outlet channel at the location where said channel departs from its tangential course and which bundle-separator channel has an inlet end which continues in the substantially tangential direction. By the omission of a sieving operation, the energy demand for entraining a mat of unsieved material within the casing of the defibering unit is eliminated, and the danger of excessive working or heating the fibres in the defibering unit is also eliminated. Furthermore, by the prescribed design of the outlet there is obtained- through the predominent influence of the centrifugal forces on the heavier fibre bundles and the predominent influence of the Coanda-effect on the lighter, separated fibres - an automatic separation of the flow of material departing through the outlet into a part-stream containing the fibre bundles and a part-stream consisting essentially of separated fibres.

The invention also relates to a method for producing a fibre web from pulp, comprising dividing pulp into pieces, defibering the pulp while forming a stream of gas-suspended, mutually-separated fibres and bundles of incompletely defibered pulp, separating fibre bundles from said stream, and forming remaining fibres into a fibre web, wherein the defibering process is carried out in a defibering unit of the kind which includes a rotor rotatably journalled in a stationary casing having a pulp inlet and an outlet for the mutually separated fibres, the periphery of said rotor being spaced from the inner surface of the casing and carrying thereon a plurality of defibering hammers which are intended to coact with a pulp shredding surface which is located on the inner surface of the casing in a region extending from the pulp inlet to the fibre outlet. The method according to the invention is characterized in that

subsequent to having once passed the shredding surface the stream formed in the defibering unit is slung outwardly, substantially in its entirety and substantially tangentially from the casing, whereupon the stream is divided into a first part-stream which is caused to follow a guide surface which extends initially substantially tangentially from the upstream edge of the outlet and then curves outwardly, said part stream containing almost exclusively mutually separated fibres due to the occurrent Coanda-effect, and into a second part-stream which contains the remainder of the gas-suspended material, including the fibre bundles, and which follows a substantially tangential course from the stream-dividing location.

Further advantageous characteristic features of the invention will be evident from the following description of an exemplifying embodiment thereof and from the depending claims.

According to one aspect of the invention there is provided a method for producing fibre webs, said method, in comparison with conventional methods, having the advantage that the production of said fibre webs is effected in one single, continuous process in the absence of intermediate transportations and without needing to store and meter intermediate products. The width of the starting material, i.e. the roll pulp, is essentially the same as the width of the fibre web produced, and the various process steps between feeding-in the starting material into the apparatus and discharging the final product therefrom are all carried out at the same width. No collection of intermediate products takes place in conduits or the like and no changes in width are necessary during the process, and consequently the material spread initially found in the roll pulp is used in the process. This enables fluff mats of low surface weight or grammage to be produced and a better final product to be obtained at lower energy consumptions. The energy consumed is also reduced owing to the fact

that a smaller number of fans is required to create the requisite air flow, optimally only one fan. The thickness of the fibre web is directly proportional to the infeed speed of the roll pulp and can thus be adjusted very simply, by commensurate adjustment to the infeed speed of said pulp. In the manufacture of disposable diapers, for instance, there is a need to vary the layer thickness along the length of the diaper, which can readily be achieved by pulsated infeed of the roll pulp.

The inventive apparatus and method provide a fluff mat of high quality, in that the extraction of high quality long and medium-long fibres can be maximized while at the same time separating-out the remaining fibre bundles, and by forming the mat in the immediate vicinity of the defibering process where mutual separation of the fibres is most pronounced.

Brief description of the drawings

An exemplifying embodiment of the inventive apparatus will now be described with reference to the accompanying drawings, in which

- Figure 1 is a vertical, sectional view of an inventive arrangement;
- Figure 2 is a sectional view taken on the line II-II in Figure 1;
- Figure 3 is a sectional view taken on the line III-III in Figure 1;
- Figure 4 is an enlarged vertical view in section of a pulp-clipping hammer according to Figure 1;
- Figure 5 is a perspective view of the clipping hammer according to Figure 1;
- Figure 6 is an enlarged vertical view in section of a defibering hammer according to Figure 1;
- Figure 7 is a perspective view of the defibering hammer

according to Figure 1; and

- Figure 8 is a principle diagram of bundle separator and forming device according to Figure 1.

Detailed description of a preferred embodiment of the invention

Figure 1 illustrates the steps of infeeding, clipping defibering, separating and forming starting material in the form of roll pulp 1 into a final product in the form of a fluff web or mat 2. The width of the roll pulp 1 can vary, perferably between about 0.1 m up to 1 m, depending upon the desired width of the fluff mat. The roll pulp 1 is fed between two feed rollers 3 - which suitably can be driven at a controllable speed - into an infeed opening 4 in a stationary casing 5 of a pulp-clipping and pulp-defibering unit. The roll pulp 1 moves along an anvil knife 6 (see also Figure 4) which is mounted on the outside of the casing 5 adjacent the infeed opening 4. Rotatably mounted in the casing 5 is a drum or rotor 7, the axial extension of which is substantially equal to the width of the infeed opening 4 and the roll pulp 1, respectively. The drum 7 has mounted thereon a plurality of clipping hammers 8 which are disposed over the outer peripheral surface of the drum, preferably in uniform spaced relationship, along a number of axially extending axles on the drum surface (see Figure 2). As the drum 7 rotates, each clipping hammer 8 disposed along the drum periphery will coact in sequence with the anvil knife 6, so as to clip pieces successively from the pulp along the whole width of the roll pulp. The displacement between consecutive clipping hammers in the direction of the drum rotation axis is smaller than, or substantially equal to the maximum width $b_1$ of each clipping hammer.

The clipping hammer 8 is shown in more detail in Figures 4 and 5. As illustrated in Figure 4, the clipping hammer 8 is pivotally mounted on the cylindrical drum 7. The peripheral

speed of the drum 7, which is preferably between 50-150 m/s, generates on the hammer 8 a centrifugal force which is sufficient to move the hammer to a radial position during normal operation. If, on the other hand, foreign particles enter the path of the hammer, the hammer is able to swing to one side, and thereby avoid damage to the apparatus. The clipping hammer 8 comprises a tool holder 9 in which there is arranged a cutter 10 which is preferably made of hardmetal and which has the width $b_1$. The cutter 10 coacts with the anvil knife 6 as the drum rotates, thereby clipping or cutting a piece from the roll pulp. In order to obtain an effective clipping actio it is essential that the pivot centre of the hammer 8 and the edge of the cutter 10 are disposed on the axis 27 which passes through the centre of gravity of the hammer.

As will be seen from Figures 1 and 3, a number of defibering hammers 11 are disposed on the drum 7, these hammers being preferably positioned symmetrically around the drum periphery, along axially extending axles. The defibering hammers 11 (see also Figures 6 and 7) coact with a shredder surface 12 fixedly mounted on the casing 5. The shredder surface is patterned, preferably toothed, or smooth and has an extension along the peripheral surface of the casing corresponding to about 180°C of arc in the shown embodiment for mutually separating fibres from the clipped pulp. In order to increase the friction, the defibering surface of the defibering hammers may be patterned, preferably serrated or toothed, as illustrated in Figures 6 and 7. The segment of the casing carrying the shredder surface 12 may be adjustable, e.g. by pivoting about an axis arranged adjacent to the knife 6 and in parallel with the drum axis, for controlling the distance between the shredder surface and the active surfaces of the defibering hammers 11. The latter surfaces have a width $b_2$ (Figure 7) dimensioned in manner such that the shredder surface 12 will be traversed by said surfaces along its entire extension as seen in the

direction of the drum axis.

Arranged in the casing 5 is a rectangular outlet or web-forming opening 13, to the upstream edge of which is connected an upper part of a first, permeable endless conveyor belt 14, said part extending initially tangentially and then curving outwardly towards a second, permeable endless conveyor belt 15. More specificly, the upper part or run of the conveyor belt 14 forms a lower guide surface or wall of an outlet channel which is connected to the fibre outlet opening 13 and which initially has a substantially tangential extension relative to the casing 5 and thereafter an outwardly curved extension. Because of the comparatively large opening 13, the mutually separated fibres as well as the insufficiently defibered pulp are thrown out of the defibering unit, and because of the Coanda-effect the mutually separated fibres tend to follow the guide surface or wall formed by the upper run of the conveyor belt 14, while because of the influence of the centrifugal force the heavier particles or fibre bundles tend to continue their travel in a tangential direction. The two conveyor belts are movable on a number of rotatable rollers 16 and form, sequentially, a fluff-mat forming path. A forming hood 17 is located adjacent the forming opening 13 on the upper side or run of the first conveyor belt 14, and a first suction box 18 is positioned adjacent the forming opening 13 on the underside of the upper run of belt 14, so as to generate a subpressure on said underside when forming the fluff mat on the conveyor belt 14 (see also Figure 8). This first suction box 18 is connected to a forming hood 19 on that side of the second conveyor belt 15 on which the constructed fluff mat is carried, and a second suction box 20 is positioned on the opposite side of the belt so as to create a subpressure on said opposite side. The embodiment illustrated in Figure 1 also includes a fan 21 which is connected to

the two suction boxes 18, 20, and a simple filter 22 for filtering exhaust air.

Mounted adjacent the outlet or forming opening 13 is a fibre-bundle separator 23, which functions to collect the non-defibered or insufficiently defibered pulp and to conduct said pulp back to the defibering unit for furhter processing. The bundle separator 23 includes a bundle-separator channel 24 which branches from the outlet channel at the location where said channel departs from its tangential course and which bundle-separator channel has an inlet end which continous in the substantially tangential direction. The channel 24 which extends outside the cylindrical casing 5, then curves arcuately inwards and connects with the casing in the proximity of the infeed opening 4. An ejector device 25 having an air inlet 26 generates a pressure drop in relation to the forming opening 13 at the adjoinment of the channel 24 with the casing, the air stream thus created entraining the fibre bundles into a new defibering phase.

The aforedescribed embodiment of the invention provides a fluff mat of very high quality at a mat grammage which is greater than about 75 $g/m^2$. When dry-forming mats whose grammage lies between 25 and 75 $g/m^2$, eddy currents or vortices can occur between the forming hood 17 and the first conveyor belt 14, which result in irregularities in the fluff mat. These vortices are negligible at higher grammages. An alternative embodiment of the inventive apparatus will provide a fluff mat of good quality in the manufacture of webs of low grammages. In this alternative embodiment, the forming hood 17 at the first conveyor belt 14 is removed, so that atmospheric pressure will prevail over the belt, and instead a fan is provided at the air inlet 26

so as to create an overpressure in the defibering unit.

The Modus Operandi of the invention

The roll pulp 1 is taken from a pulp reel and fed between the feed rollers 3 and along the anvil knife 6, and is clipped against the edge of said knife into pieces of appropriate large size upon engagement with the rotating clipping hammers 8. Each clipping hammer will thus function to sever a pulp piece which is smaller than or equal to the width of the cutter 10. The height of the pulp piece is controlled by the speed at which the pulp is advanced in combination with the rotational speed of the drum 7. The severed pulp piece is ground, kneeded, rolled, clipped and worked between the rotating defibering hammers 11, with their toothed or serrated heads, and the smooth or toothed shredder surface 12. Major proportions of the pulp fibres are mutually separated during passage of the pulp from the infeed opening 4 to the forming opening 13.

Subsequent to having passed through the defibering unit, the pulp pieces will have been converted to mutually separated short (<1 mm), average-long (about 1-3 mm) and long fibres (>3 mm) and non-defibered bundles. The bundles are heavy and have a high kinetic energy and therefore attempt to continue to move in a straight, forward path (i.e. tangentially), wherewith the bundles are separated from the separated fibres by being slung tangentially into the bundle separator 23 and flow through said separator, under the influence of the pressure difference prevailing between the forming opening 13 and the separator outlet. The fibre bundles are then returned to the defibering unit, where they are again worked to separate the fibres contained therein.

The long, medium-long and short fibres follow the curved

surfaces of the suction box 18 and the conveyor belt 14, as a result of the Coanda-effect, and successive forming of the fluff mat commences on the moving belt. The perviousness of the belt is so selected that long and average-long fibres will be deposited to form a fluff mat 2, whereas short fibres are sucked through the belt by the subpressure force acting in the suction box 18. Upon completion of the mat-forming process, the fluff mat will essentially consist of solely long and average-long fibres, which impart a high network strength to the mat. The short fibres, which impart no strength to the mat, are thus extracted in the mat-forming process.

Those short fibres which have passed with the air flow through the first conveyor belt 14 are sucked further to the forming hood 19 located in the immediate vicinity of the second conveyor belt 15. Because the short fibres can be used beneficially as absorption material, they are returned to the fluff mat, which because of its tightness functions as a one-time filter for the air sucked out. The air flow is drawn through the fluff mat by the subpressure prevailing in the second suction box 20, wherewith the short fibres are deposited on, and partially in the fluff mat. The cleansed air flow passes through the fan 21 and a single filter 22, and from there out into the sorrounding air. More than 99 % of the starting material, i.e. the roll pulp, is recovered when practising this method.

It will be understood that the invention is not restricted to the aforedescribed exemplifying embodiments and that several modifications are conceivable within the scope of the following claims. For instance, both the shredder surface and the defibering surface on the defibering hammers may have different pattern configurations, such as toothed, fluted, undulating or other pattern configurations. The

radius of the defibering surface of the defibering hammers may vary and the defibering hammers, and also the clipping hammers, may be pivotally mounted on the drum, for safety reasons. The clipping hammers may be provided with a cutter which is positioned obliquely in relation to the anvil knife, instead of being parallel. In the case of the described embodiment, the extension of the shredder surface corresponds to about 180° of arc, although the surface may vary in size between a value corresponding to a comparatively small angle of arc to an extension along the whole of the surface from the inlet opening to the forming opening. The shredder surface or the casing may be pivotally mounted adjacent the anvil knife so as to enable adjustments to be made to the distance between the defibering hammers and the shredder surface and therewith adapt the apparatus to mutually different types of pulp. The conveyor belt 14 may be adjoined to the forming opening 13 with a transverse edge, a so-called set-off, which forms beneath the air stream a small space in which there is generated a subpressure which assists in guiding the air-fibre stream along the conveyor belt. In the event that the forming process does not take place immediately after the defibering process, then the conveyor belt 14 may be replaced by an unperforated guide surface or plate. It also lies within the scope of the invention to shred or clip the pulp into pieces in a separat unit preceeding the defibering unit. Futhermore, the separated fibre bundles can be conveyed, for instance, to a collecting bin, from which they could be conveyed to the defibering unit.

Claims

1. An arrangement in apparatus for producing a fibre web (2) from pulp (1) and comprising a clipping unit (3, 6, 8) which functions to divide the pulp into pieces, a defibrering unit (5, 7, 11) which functions to mutually separate fibres in the clipped pulp pieces and to form a stream of gas-suspended fibres, a forming unit (15-20) which includes at least one endless, gas-permeable conveyor belt (14) and which functions to construct a fibre web (2) from the suspended fibres on one side of the conveyor belt at the same time as a subpressure is maintained on opposite side of the conveyor belt, and a fibre-bundle separator (23) which functions to remove bundles of incompletely defibered pulp from the mutually separated fibres, wherein the defibering unit includes a rotor (7) which is rotatably journalled in a stationary casing (5) having a pulp inlet (4) and an outlet (13) for mutually separated fibres, and wherein the periphery of the rotor (7) is spaced from the inner surface of the casing and carries thereon a plurality of defibering hammers (11) which are intended to coact with a pulp shredding surface (12) located on the inner surface of the casing within a region extending from the pulp inlet to the fibre outlet, c h a r a c t e r i z e d in that the fibre outlet (13) is an opening through which both the mutually separated fibres and the incompletely defibered pulp can exit from the casing (5) and with which there is connected an outlet channel which initially has a substantially tangential extension relative to the casing and thereafter an outwardly curved extension, while the bundle separator (23) includes a bundle-separator channel (24) which branches from the outlet channel at the location where said channel

departs from its tangential course and which bundle-separator channel (24) has an inlet end which continues in the substantially tangential direction.

2. An arrangement according to Claim 1, c h a r a c t e r i z e d in that the bundle-separator channel (24) curves arcuately inwards in the region downstream of said inlet end and in that the remaining end of said channel opens into the casing (5) of the defibering unit, preferably upstream of the pulp inlet (4).

3. An arrangement according to Claim 1 or 2, c h a r a c t e r i z e d in that in addition to the defibering hammers (11), the rotor (7) has mounted thereon a plurality of clipping hammers (8) which are intended to coact with at least one anvil knife (6) mounted on the casing (5) in a manner to clip pulp (1) delivered, preferably in strip form, through the pulp inlet (4).

4. An arrangement according to Claim 3, c h a r a c t e r i z e d in that each clipping hammer (8) comprises a tool holder (9) in which a cutter (10), preferably a hardmetal cutter, is mounted, and in that the clipping hammer is pivotally mounted on the rotor (7) with its pivot centre and the edge of said cutter (10) disposed on the centre-of-gravity axis (27) of the clipping hammer.

5. An arrangement according to any one of Claims 1-4, c h a r a c t e r i z e d in that the inlet (4) and the outlet (13) of the casing (5) have an extension which corresponds to the axial extension of the rotor (7) and the width of the fibre web (2) formed on the conveyor belt (14) respectively.

6. An arrangement according to any one of Claims 3-5, c h a r a c t e r i z e d by a device (3) for feeding a roll pulp web (1) through the pulp inlet (4) at a controllable speed.

7. An arrangement according to any one of Claims 2-6, c h a r a c t e r i z e d by a gas inlet (26) in the form of an ejector which opens out in the region where the bundle-separator channel (24) opens out into the casing (5), for the purpose of generating a subpressure in said bundle-separator channel from its inlet opening end to its outlet opening end.

8. An arrangement according to any one of Claims 1-7, c h a r a c t e r i z e d in that the outlet channel is formed partially by a part of an endless, gas-permeable conveyor belt (14) forming part of the forming unit (15-20), said part connecting with and extending initially substantially tangentially from the upstream edge of the fibre outlet opening (13) and then curving outwardly, and in that a suction box (18) is mounted on the side of said part which faces away from the interior of the outlet channel, such as to hold firmly by suction a fibre web formed on said part and receiving fibres passing through said part and the formed web.

9. An arrangement according to Claim 8, c h a r a c - t e r i z e d by a second gas-permeable, endless conveyor belt (15) which is coupled downstream of the first-mentioned conveyor belt (14), means for holding by suction the one side of the formed fibre web (2) against a part of the second conveyor belt (15), and means for delivering fibres collected in the suction box (18) associated with said firstmentioned conveyor belt (4) to the other side

of the fibre web held by suction on a part of the second conveyor belt (15).

10. A method for producing a fibre web from pulp, comprising dividing pulp into pieces, defibering the pulp while forming a stream of gas-suspended, mutually-separated fibres and bundles of incompletely defibered pulp, separating fibre bundles from said stream, and forming remaining fibres into a fibre web (2), wherein the defibering process is carried out in a defibering unit (5, 7, 11) of the kind which includes a rotor (7) rotatably journalled in a stationary casing (5) having a pulp inlet (4) and an outlet (13) for the mutually separated fibres, the periphery of said rotor being spaced from the inner surface of the casing and carrying thereon a plurality of defibering hammers (11) which are intended to coact with a pulp shredding surface (12) which is located on the inner surface of the casing in a region extending from the pulp inlet (4) to the fibre outlet (13), c h a r a c t e r i z e d in that subsequent to having once passed the shredding surface (12) the stream formed in the defibering unit (5, 7, 11), is slung outwardly, substantially in its entirety and substantially tangentially from the casing (5), whereupon the stream is divided into a first part stream which is caused to follow a guide surface (14) which extends initially substantially tangentially from the upstream edge of the outlet (13) and then curves outwardly, said part stream containing almost exclusively mutually separated fibres due to the occurrent Coanda-effect, and into a second part-stream which contains the remainder of the gas-suspended material, including the fibre bundles, and which follows a substantially tangential course from the stream-dividing location.

11. A method according to Claim 10, c h a r a c - t e r i z e d in that the second part-stream is re-introduced into the casing (5) at a location at which pressure is lower than the location at which the stream was divided into said first and said second part streams.

12. A method according to Claim 11, c h a r a c - t e r i z e d in that said lower pressure is generated by blowing gas into the casing (5) through an ejector (25) in the immediate vicinity of the location at which the second part-stream is introduced into the casing (5).

13. A method according to any one of Claims 10-12, c h a r a c t e r i z e d in that the guide surface used to guide said first part-stream in an initial tangential course and thereafter an outwardly curved course has the form of a gas-permeable conveyor (14), and in that the fibre web (2) is formed directly on the conveyor.

14. A method according to Claim 13, c h a r a c - t e r i z e d in that a subpressure is maintained on the side of the conveyor (14) opposite to the fibre web (2), and in that fibres which pass through the conveyor (14) are collected and, in a later stage, delivered to the fibre web (2) while suspended in a gas flow passing therethrough.

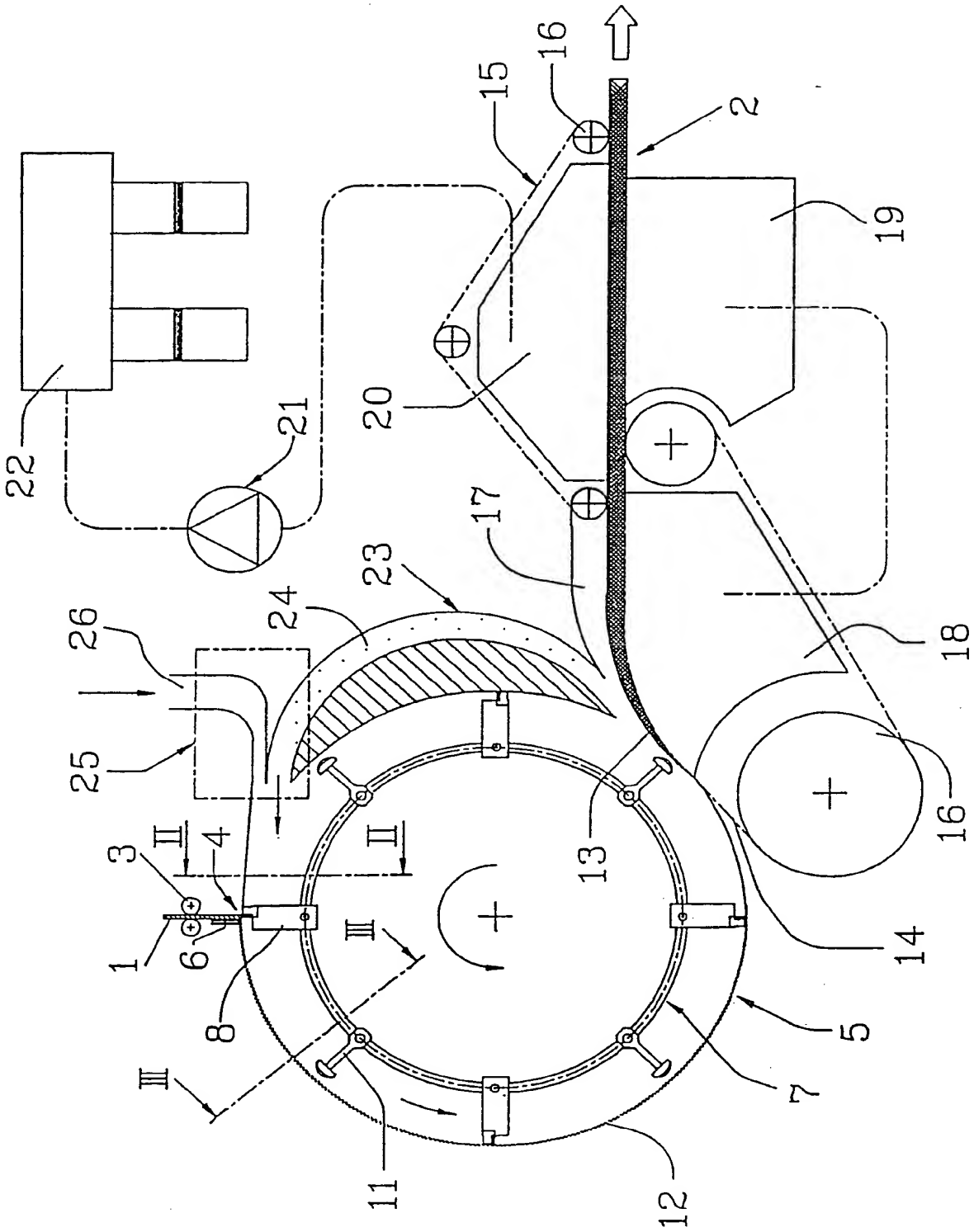


FIG.1

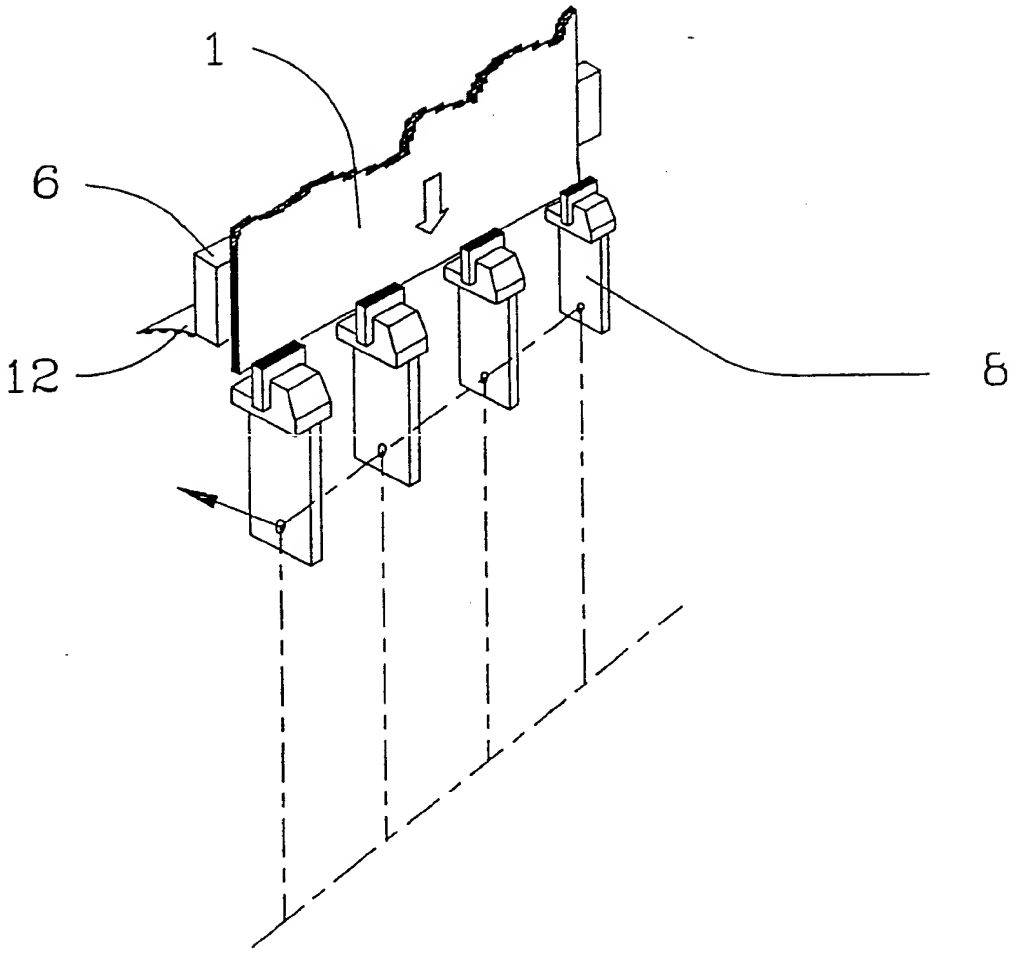


FIG. 2

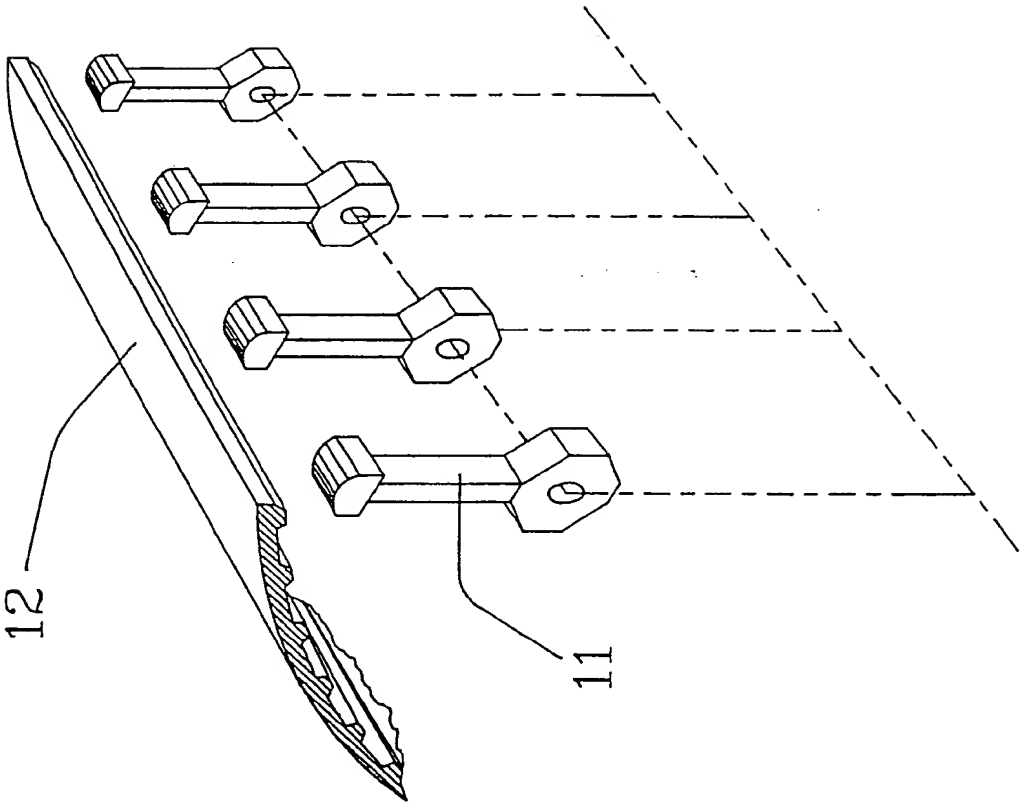


FIG.3

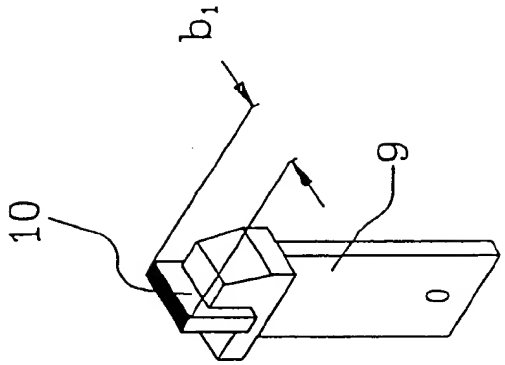


FIG.5

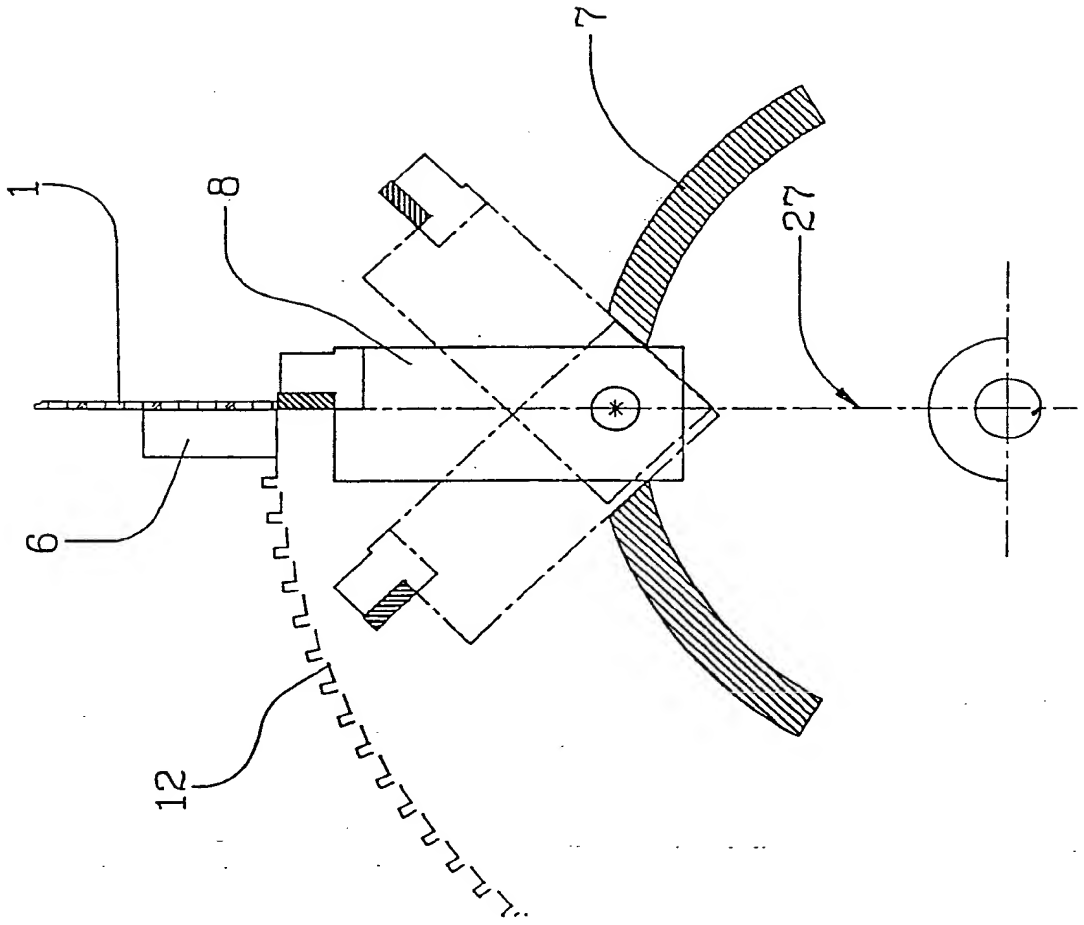


FIG.4

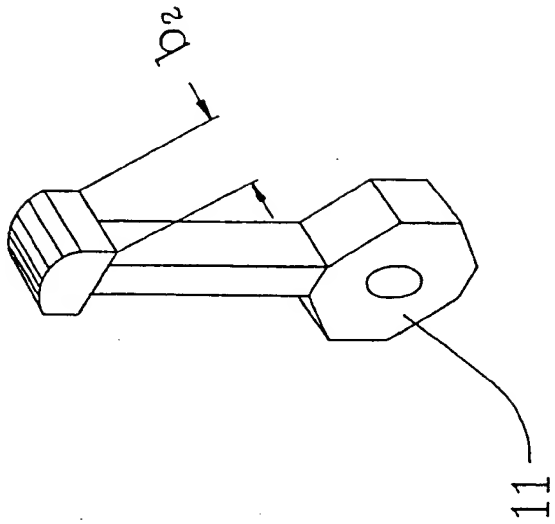


FIG.7

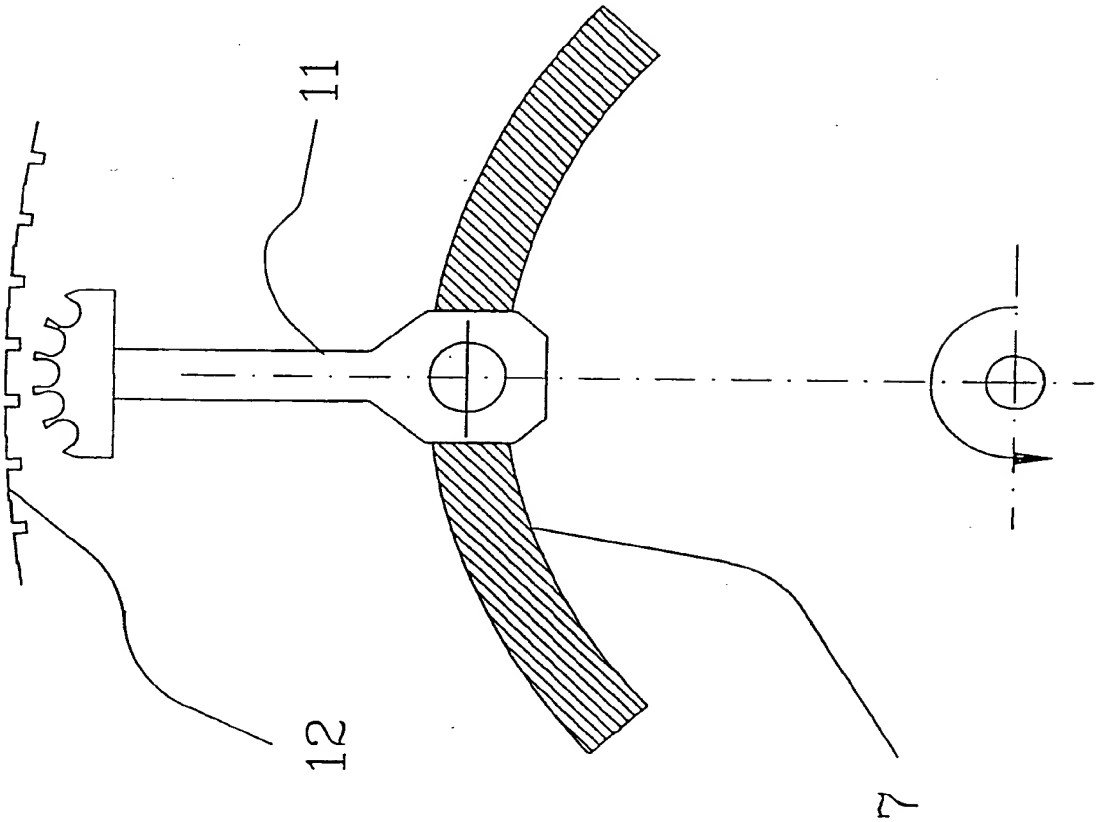


FIG.6

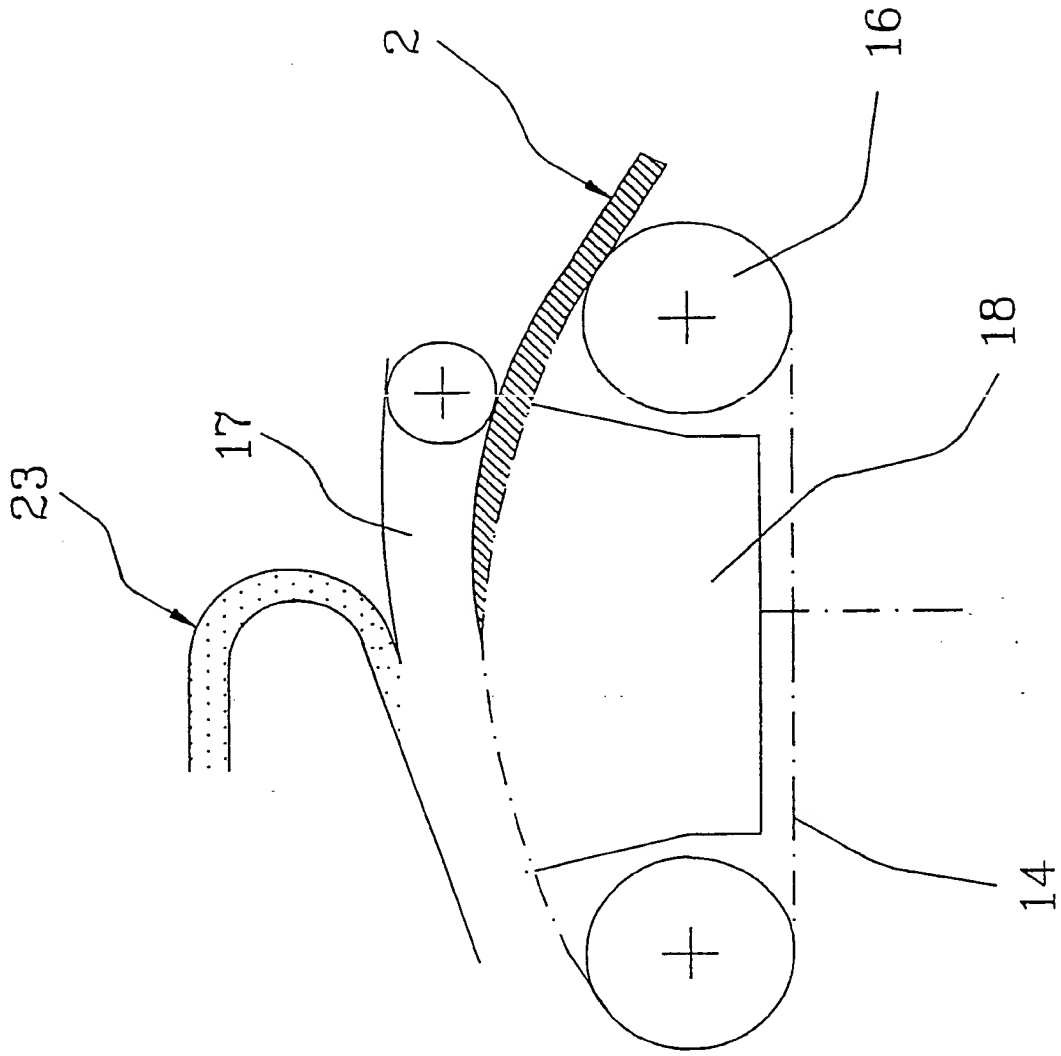


FIG.8